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Lake Mich. Dist.

SOIL TESTING SERVICES OF WISCONSIN, INC.

540 LAMBEAU ST.

GREEN BAY, WIS. 54303

March 4, 1976

Harris & Associates, Inc.
718 North Main Street
Appleton, Wisconsin 54911

Attention: Mr. Ted Harris

STS Job 6148-A

RE: Preliminary geohydrological report for the Proposed Lehrer Landfill Site
located in the Town of Buchanan in Outagamie County, Wisconsin.

Gentlemen:

In accordance with your authorization, we have proceeded with the initial geohydrological investigation for the above noted site. Enclosed here are the preliminary results of this study. Please note that the information and data enclosed should be considered as preliminary since additional pertinent data, specifically with regard to water levels and ground water quality, is yet to be determined. The final geohydrological study will be submitted under separate cover when all additional data has been obtained. Four copies of this preliminary report have been sent to the above addressee.

If you have any questions with regard to this report, do not hesitate to contact us.

Yours very truly,

SOIL TESTING SERVICES OF WISCONSIN, INC.

Timothy K. Dahlstrand
Registered Professional Engineer, Wisconsin

TKD/cs

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AFFILIATE OF SOIL TESTING SERVICES, INC.

GREEN BAY PHONE (414) 494-9656
WAUSAU, WISCONSIN - 715-845-8386
MARQUETTE, MICHIGAN - 906-225-1417
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BRUCE M. THORSON, P.E.
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JOHN P. GNAEDINGER, P.E.
CLYDE N. BAKER, P.E.
DAVID B. EDLBECK
PHILLIP C. BEST
HANS J. REGNIER, CET

SCOPE OF PRELIMINARY REPORT

At the present date, the geohydrological study for the Lehrer Landfill Site, which is located in parts of Sections 21 and 22, Township 21 north, Range 18 east, Town of Buchanan, Outagamie County, Wisconsin, is not yet complete.

The additional work to be performed at this site includes the following:

1. Install three additional shallow wells at the nested well locations of borings 1, 3, and 5, to more accurately determine the uppermost piezometric surface.
2. Install one, 4 inch diameter well within the existing landfill area to monitor any leachate accumulations in such.
3. Perform ground water quality tests from the existing thirteen wells at the site. The parameters which will be tested include pH, conductivity, chlorides, sulfate, total dissolved solids, and COD.
4. Additional monitoring of the existing wells is required since the ground water level within the wells has not yet stabilized.

Because the above data is yet to be generated from this project, this geohydrological report should be considered only as a preliminary submittal, and for this reason, a detailed discussion and analysis is not included with this report. This submittal includes the following information:

1. Soil boring location diagram.
2. Soil boring logs.
3. Laboratory test results (constant head permeability and Atterberg limits)
4. Generalized soil profiles.
5. Topographic map of site
6. Topographic plan view of site showing existing surface drainage.

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7. Ground water contour maps depicting ground water flow directions in the following elevation ranges:

619 to 627

627 to 645

645 to 665

665 to 690

8. Preliminary generalized ground water equipotential cross sections (please note that these cross sections were prepared using the latest available ground water data and are subject to further change).

9. Details of the observation well installations.

10. Summary of all ground water level readings obtained at the project site.

11. Summary of vertical ground water gradients.

The above information is supplied without engineering analysis or text since much of it is preliminary, and it is our opinion that additional pertinent data is yet to be realized.

PRELIMINARY OPINION AS TO SITE FEASIBILITY

On the basis of the available soil and ground water obtained to date, it is our opinion that the Lehrer Site is well suited for development into a sanitary landfill. In general, cohesive soils were found to underlay the entire site, having average coefficients of permeability in the range of 1.9×10^{-8} to as low as 7.6×10^{-9} cm/sec. From the soil borings performed at this project site, a well defined geologic profile is obtained. Bedrock was encountered at 50 to 100 feet at the site depending on the surface elevation. The bedrock is flat-lying at approximately elevation 620.

The ground water flow direction was found to be, on the average, in an easterly direction although components at various elevations may tend northeasly or southeasly. This is a ground water recharge area. Because of the low

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coefficients of permeability in the subsoils at this site, horizontal and vertical, travel times for the ground water are extremely long.

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INDEX TO APPENDIX

1. Soil boring location plan and topographic map.
2. Existing surface drainage.
3. Index to Generalized Soil Profiles.
4. Generalized Soil Profile,
Section A-A
Section B-B
5. General Notes
6. Procedures regarding Field Logs, Laboratory Data Sheets and Samples.
7. Soil Boring Logs
8. Schematic Observation Well Installations Sections
9. Summary of Constant Head Permeability Test Results
10. Summary of Water Level Observations
11. Preliminary Generalized Ground Water Equipotential Cross Sections,
Section A-A
Section B-B
12. Ground Water Contour,
619 to 627
627 to 645
645 to 665
665 to 690
13. Summary of Vertical Ground Water Gradients.
14. Soil Maps.

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LEHRER LANE

KAUKAUNA CITY LIMITS
TOWN OF BUCHANAN

OAKRIDGE AVENUE

B-3, 3A, 3B



OVERHEAD POWER LINE

KANKAPOT CREEK

B-4, 4A

PRESENT FILL SITE

AREA THAT HAS BEEN FILLED AND COVERED

(DRILLED IN 1974)

B-2

B-1, 1A

(B-1 DRILLED IN 1974)

AREA THAT HAS BEEN FILLED AND COVERED

B-6, 6A, 6B

B-5, 5A, 5B

SOIL TESTING SERVICES OF WISCONSIN, INC.

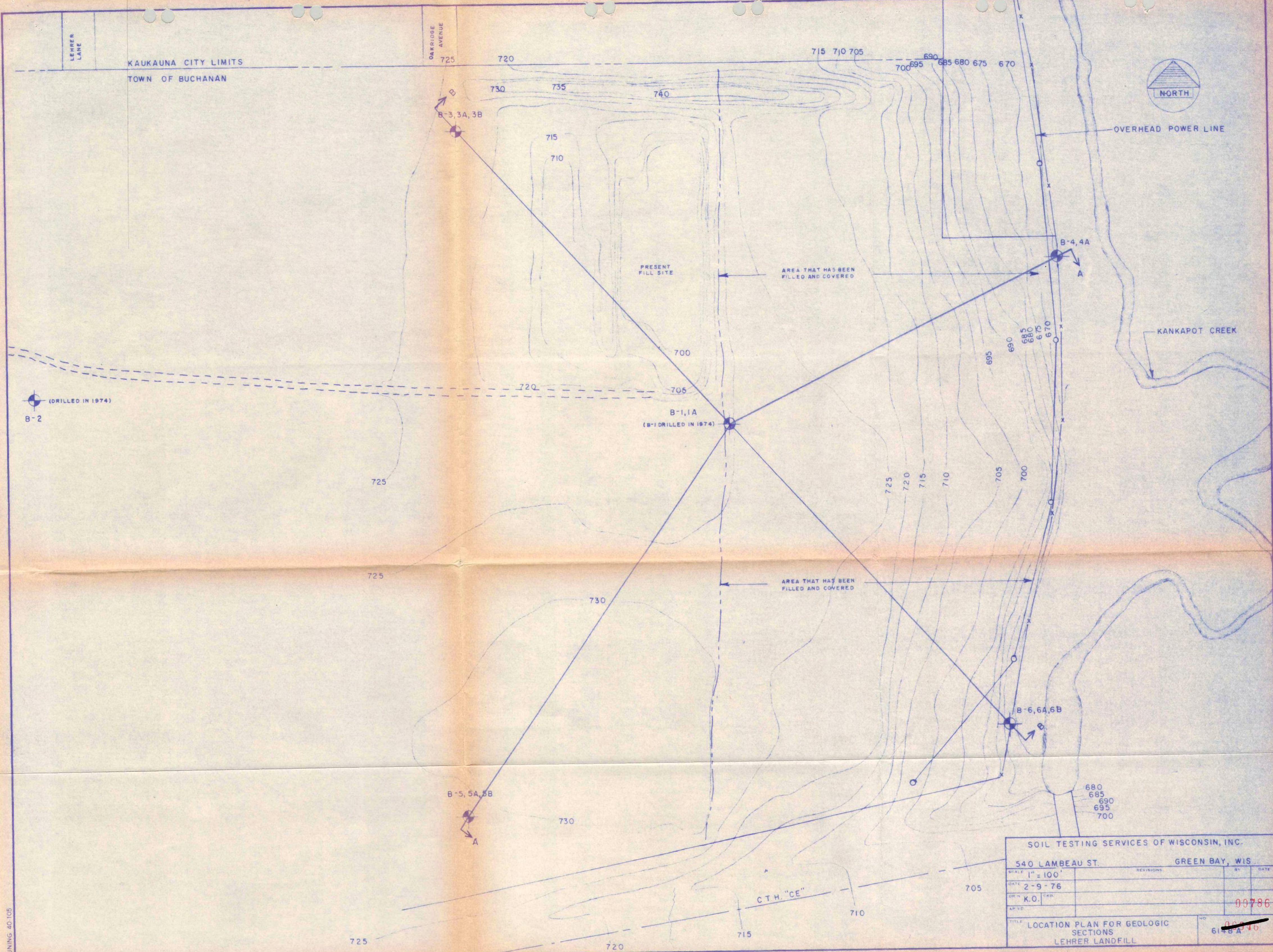
540 LAMBEAU ST. GREEN BAY, WIS.

SCALE 1" = 100'	REVISIONS	BY	DATE
DATE 2-9-76			
DR N K.O. CKD			
AP'D			
TITLE EXISTING SURFACE DRAINAGE LEHRER LANDFILL	NO. 6148 A		

C.T.H. "CE"

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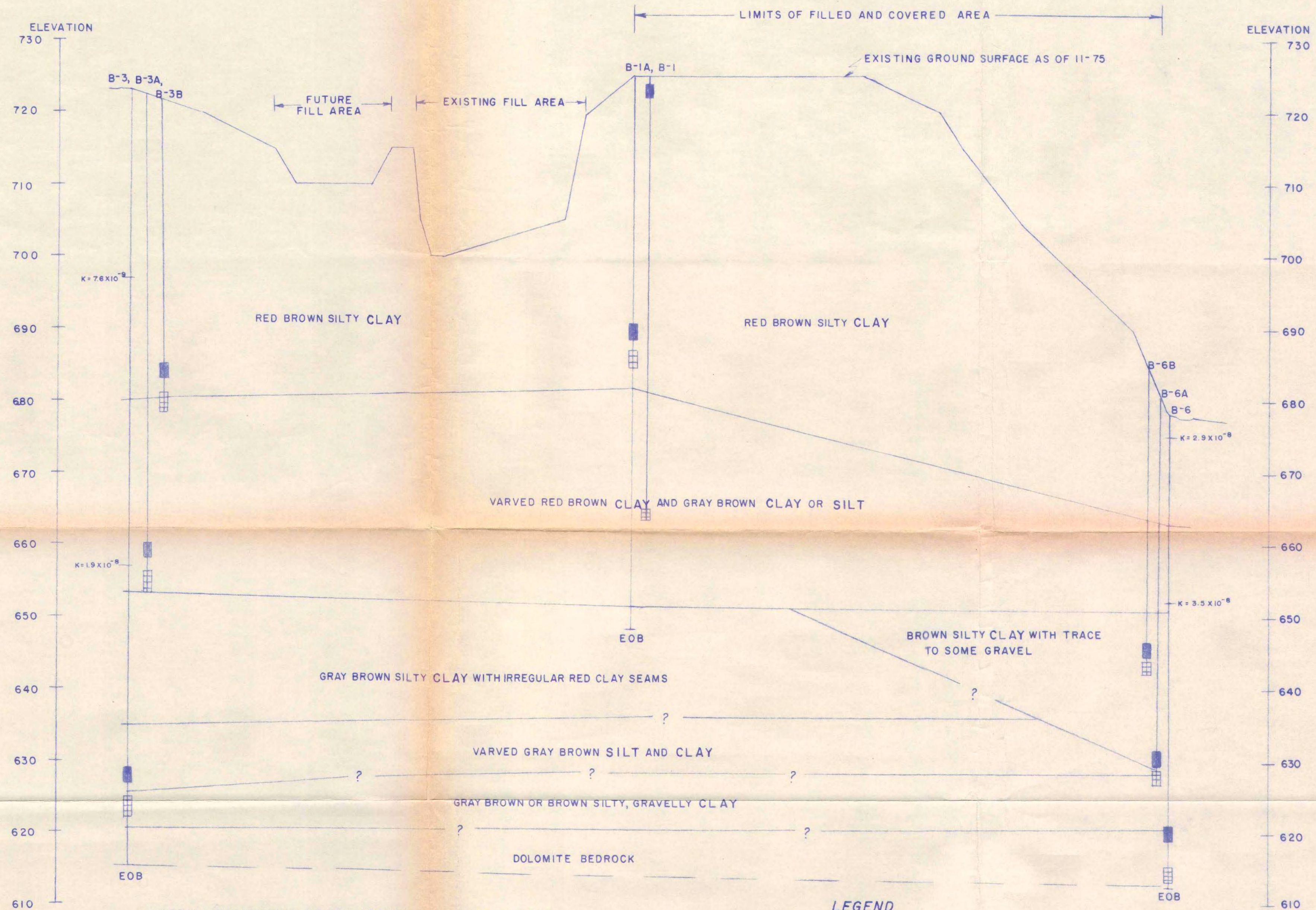
6148 A



BRUNING 40-105

SOIL TESTING SERVICES OF WISCONSIN, INC.			
540 LAMBEAU ST.		GREEN BAY, WIS.	
SCALE 1" = 100'	DATE 2-9-76	BY	DATE
DRN K.O.	CHKD	00786	
APR 76		00746	
TITLE LOCATION PLAN FOR GEOLOGIC SECTIONS LEHRER LANDFILL		NO 6148A	

GENERALIZED SOIL PROFILE SECTION B-B



NOTES: 1. PROJECTIONS OF SOIL STRATA ARE BASED ON DATA OBTAINED AT BORING LOCATIONS. SOIL CONDITIONS BETWEEN BORINGS MAY VARY.
2. PROFILE PREPARED FROM 11-75 TOPOGRAPHIC MAP BY CAROW LAND SURVEYING COMPANY, APPLETON WISCONSIN

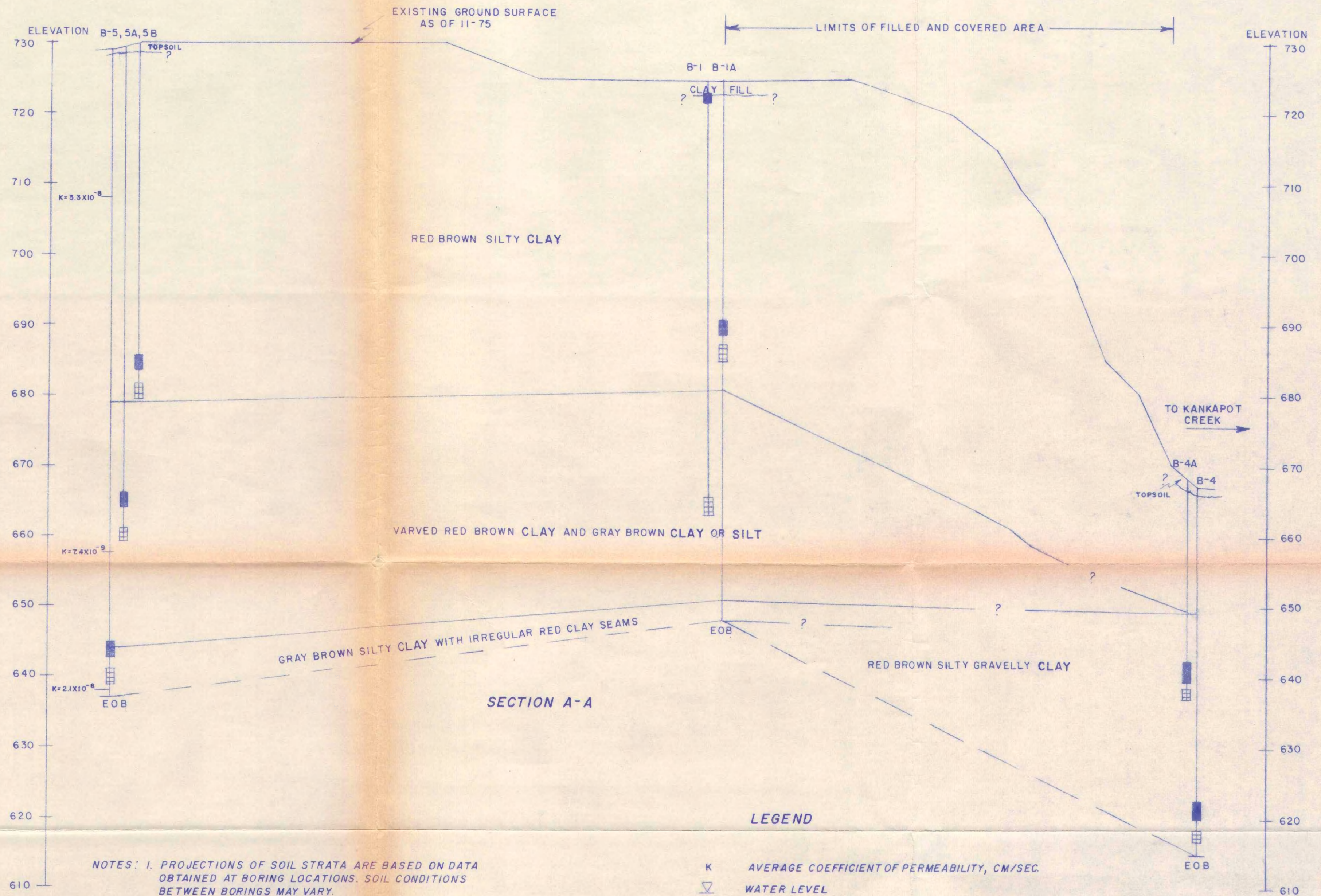
LEGEND

- K AVERAGE COEFFICIENT OF PERMEABILITY, CM/SEC.
 WATER LEVEL
 BENTONITE SEAL
 WELL TIP
 EOB END OF BORING

SCALE: VERT. 1" = 10'
HORIZ. 1" = 100'

SOIL TESTING SERVICES OF WISCONSIN, INC.			
540 LAMBEAU ST.		GREEN BAY, WIS.	
SCALE	REVISIONS	BY	DATE
DATE 2-9-76			
DRN K.O.	CKD		
AP VD			
TITLE		NO.	
LEHRER LANDFILL		6148 A	

GENERALIZED SOIL PROFILE SECTION A-A



NOTES: 1. PROJECTIONS OF SOIL STRATA ARE BASED ON DATA OBTAINED AT BORING LOCATIONS. SOIL CONDITIONS BETWEEN BORINGS MAY VARY.
2. PROFILE PREPARED FROM 11-75 TOPOGRAPHIC MAP BY CAROW LAND SURVEYING COMPANY, APPLETON WISCONSIN.

LEGEND

- K AVERAGE COEFFICIENT OF PERMEABILITY, CM/SEC.
- ▽ WATER LEVEL
- BENTONITE SEAL
- WELL TIP
- EOB END OF BORING

SCALE: VERT. 1"=10'
HORZ. 1"=100'

SOIL TESTING SERVICES OF WISCONSIN, INC.			
540 LAMBEAU ST.		GREEN BAY, WIS.	
SCALE	REVISIONS	BY	DATE
DATE 2-6-76			
DR. N. K.O.	CHKD.		
AP. VD.			
TITLE LEHRER LANDFILL		NO. 0078400044	

GENERAL NOTES

1950 Chicago Building Code Soil Classifications are Used Except Where Noted

DRILLING & SAMPLING SYMBOLS

SS : Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted
ST : Shelby Tube - 2" O.D., except where noted
PA : Power Auger Sample
DB : Diamond Bit - NX: BX: AX:
CB : Carboloy Bit - NX: BX: AX:
OS : Osterberg Sampler - 3" Shelby Tube
HS : Housel Sampler
WS : Wash Sample
FT : Fish Tail
RB : Rock Bit
WO : Wash Out

Standard "N" Penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2 inch OD split spoon, except where noted.

WATER LEVEL MEASUREMENT SYMBOLS

WL : Water Level
WCI : Wet Cave In
DCI : Dry Cave In
WS : While Sampling
WD : While Drilling
BCR : Before Casing Removal
ACR : After Casing Removal
AB : After Boring

Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable ground water levels. In impervious soils, the accurate determination of ground water elevations is not possible in even several days observation, and additional evidence on ground water elevations must be sought.

CLASSIFICATION

COHESIONLESS SOILS

"Trace"	:	1% to 10%	
"Trace to some"	:	10% to 20%	
"Some"	:	20% to 35%	
"And"	:	35% to 50%	
Loose	:	0 to 9 Blows	
Medium Dense	:	10 to 29 Blows	} or equivalent
Dense	:	30 to 59 Blows	
Very Dense	:	≥ 60 Blows	

COHESIVE SOILS

If clay content is sufficient so that clay dominates soil properties, then clay becomes the principle noun with the other major soil constituent as modifier; i.e., silty clay. Other minor soil constituents may be added according to classification breakdown for cohesionless soils; i.e., silty clay, trace to some sand, trace gravel.

Soft	:	0.00 — 0.59 tons/ft ²
Stiff	:	0.60 — 0.99 tons/ft ²
Tough	:	1.00 — 1.99 tons/ft ²
Very tough	:	2.00 — 3.99 tons/ft ²
Hard	:	≥ 4.00 tons/ft ²

GENERAL NOTES

STS

SOIL TESTING SERVICES OF WISCONSIN, INC.

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LEHRER
LANE

KAUKAUNA CITY LIMITS
TOWN OF BUCHANAN

OAKRIDGE
AVENUE



OVERHEAD POWER LINE

KANKAPOT CREEK

(DRILLED IN 1974)
B-2

B-3, 3A, 3B

PRESENT
FILL SITE

AREA THAT HAS BEEN
FILLED AND COVERED

B-4, 4A

B-1, 1A
(B-1 DRILLED IN 1974)

AREA THAT HAS BEEN
FILLED AND COVERED

B-6, 6A, 6B

B-5, 5A, 5B

PRELIMINARY

01084

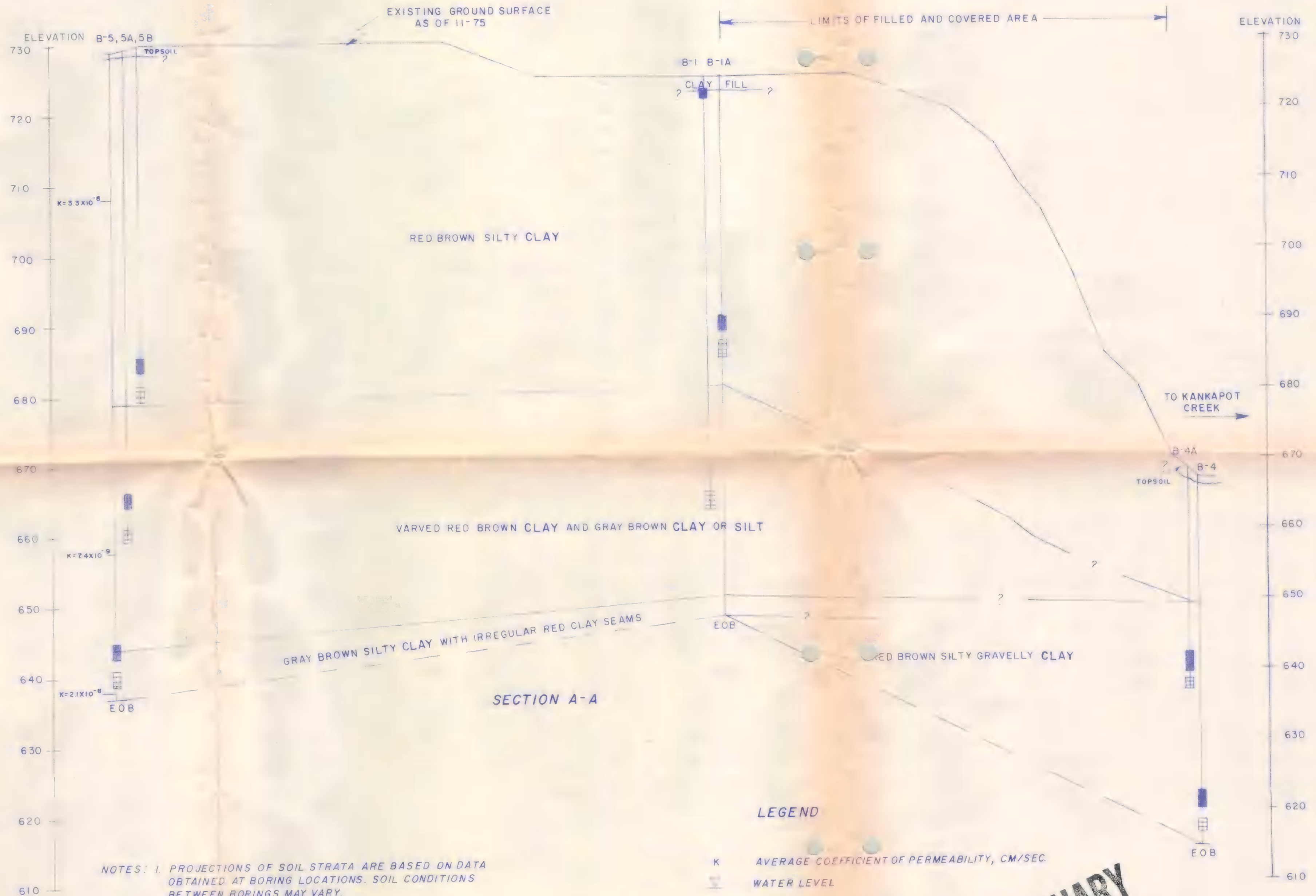
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Lake Mich. Dist.

SOIL TESTING SERVICES OF WISCONSIN, INC.
540 LAMBEAU ST. GREEN BAY, WIS.

DATE	2-9-76	BY		DATE	
ED. N.	K.O.	PRD			
NO.					

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GENERALIZED SOIL PROFILE SECTION A-A



LEGEND

- K AVERAGE COEFFICIENT OF PERMEABILITY, CM/SEC.
- Symbol: WATER LEVEL
- Symbol: BENTONITE SEAL
- Symbol: WELL TIP
- EOB END OF BORING

SCALE VERT. 1" = 10'
HORZ. 1" = 100'

PRELIMINARY

01083

SOIL TESTING SERVICES OF WISCONSIN, INC.			
540 LAMBEAU ST.		GREEN BAY, WIS.	
DATE	2-6-76	BY	
DR. N.	K.O.	CHKD.	
AP. VD.			
TITLE		NO.	
LEHRER LANDFILL		6148A	

ELEVATION
730
720
710
700
690
680
670
660
650
640
630
620
610

EXISTING GROUND SURFACE AS OF 11-75

FUTURE FILL AREA

EXISTING FILL AREA

LIMITS OF FILLED AND COVERED AREA

B-3, B-3A, B-3B

B-1A, B-1

B-6A, B-6, B-6B

RED BROWN SILTY CLAY

VARVED RED BROWN CLAY AND GRAY BROWN CLAY OR SILT

GRAY BROWN SILTY CLAY WITH IRREGULAR RED CLAY SEAMS

VARVED GRAY BROWN SILT AND CLAY

GRAY BROWN OR BROWN SILTY, GRAVELLY CLAY

DOLOMITE BEDROCK

BROWN SILTY CLAY WITH TRACE TO SOME GRAVEL

EOB

K = 7.6 X 10⁻⁸

K = 1.9 X 10⁻⁸

K = 2.9 X 10⁻⁸

K = 3.5 X 10⁻⁸

LEGEND

NOTES: 1. PROJECTIONS OF SOIL STRATA ARE BASED ON DATA

LEGEND

K AVERAGE COEFFICIENT OF PERMEABILITY, CM/SEC.

WATER LEVEL

BENTONITE SEAL

SCALE: VERT. 1" = 10'
HORIZ. 1" = 100'

WELL TIP

EOB END OF BORING

PRELIMINARY

SCALE		REVISIONS		BY	DATE
DATE 2-9-76					
DR N	K.O.	CRD			
AP VD					
TITLE LEHRER LANDFILL				NO 6148 A	

PROCEDURES REGARDING FIELD LOGS,
LABORATORY DATA SHEETS AND SAMPLES

In the process of obtaining and testing samples and preparing the report, procedures are followed that represent reasonable and accepted practice in the field of soil and foundation engineering.

Specifically, field logs are prepared during performance of the drilling and sampling operations which are intended to portray essentially field occurrences, sampling locations and other information.

Samples obtained in the field are frequently subjected to additional testing and reclassification in the laboratory by more experienced soil engineers, and differences between the field logs and the final logs exist.

The engineer preparing the report reviews the field and laboratory logs, classifications and test data, and in his judgement in interpreting this data, may make further changes.

Samples taken in the field, some of which are later subjected to laboratory tests, are retained in our laboratory for sixty days (60) and are then destroyed unless special disposition is requested by our client. Samples retained over a long period of time, even in sealed jars, are subject to moisture loss which changes the apparent strength of cohesive soil, generally increasing the strength from what was originally encountered in the field. Since they are then no longer representative of the moisture conditions initially encountered, an inspection of these samples could recognize this factor.

It is common practice in the soil and foundation engineering profession that field logs and laboratory test data sheets not be included in engineering reports, because they do not represent the engineer's final opinions as to appropriate descriptions for conditions encountered in the exploration and testing work. On the other hand, we are aware that perhaps certain contractors and subcontractors submitting bids or proposals on work might have an interest in studying these documents before submitting a bid or proposal. For this reason, the field logs will be retained in our office for inspection by all contractors submitting a bid or proposal. We would welcome the opportunity to explain any changes that have and typically are made in the preparation of our final reports, to the contractor or sub-contractors, before the firm submits its bid or proposal, and to describe how the information was obtained to the extent the contractor or sub-contractor wishes. Results of laboratory tests are generally shown on the boring logs or are described in the text of the report, as appropriate.

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LOG OF BORING NO. 1									
OWNER					ARCHITECT/ENGINEER				
Town of Buchanan					Carr, Land Surveying				
SITE					PROJECT NAME				
					Lehrer Landfill Site				
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLING METHOD	DESCRIPTION OF MATERIAL	UNIT WEIGHT LBS./FT. ³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. ²			
						PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	
SURFACE ELEVATION = 724.7									
1	ST			Silty clay, trace sand, gravel cinders, roots-red brown to black-(CL-Fill)					
2	ST								
3	ST			Silty clay, trace sand, gravel with occasional light brown silt seams-red brown-hard-(CL)					
4	ST								
5	ST								
6	ST								
7	ST			Silty clay, trace sand, gravel trace decayed roots from 20' to 22' and 1/2" to 1" peat pockets-dark brown to brown-tough to hard-(CL-CH)					
8	ST								
9	ST								
10	ST								
11	ST								
12	ST								
13	ST			Varved red silty clay(CH) and gray brown silty clay(CL-CH) in 1/8" to 1/4" layers-very tough to tough-(CH & CL-CH)					
14	ST								
15	ST								
16	ST								
17	ST								
18	ST			Silty clay, trace sand, gravel with a few irregular red clay seams-gray brown-tough to very tough-(CL-CH)					
End of Boring					*Calibrated Penetrometer				
Note: 1. Well point installed AB as per enclosed drawing with tip at 61.8' below ground surface 2. 2' of 4" casing used 3. Well point protector pipe installed 4. Elevation of top of PVC pipe=726.0									

WATER LEVEL OBSERVATIONS

W.L.	W.S. OR V.D.
W.L. 1	B.C.B.
W.L. 2	A.C.B.
W.L. 3	AB-Belled hole to 30' & installed well point

SOIL TESTING SERVICES

OF WIS., INC.
 GREEN PLY, WISCONSIN
 540 LADUEAU STREET

BORING STARTED 7-9-74
BORING COMPLETED 7-10-74
DRWN JR **FOREMAN** J.V.
APPROVED ID **DATE**

00781

00001

LOG OF BORING NO. 1											
OWNER					ARCHITECT-ENGINEER Harris and Associates						
SITE Highway 55 and CTH EE Kaukauna, Wisconsin					PROJECT NAME Proposed Lehrer Landfill						
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST. RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. 2					
						1	2	3	4	5	
						PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %			
						X				Δ	
						STANDARD "N" PENETRATION (BLOWS/FT.)					
						10	20	30	40	50	
X				SURFACE ELEVATION → 725.4							
5				No soil sampling for installing well point at 40 feet							
10		PA									
15											
20											
25		PA									
30											
35											
40											
					End of Boring						

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WATER LEVEL OBSERVATIONS			SOIL TESTING SERVICES OF WIS., INC. 540 LAMBEAU STREET GREEN BAY, WIS. 54303	BORING STARTED 12-23-75	
W.L.	None to 40' AB			BORING COMPLETED 12-23-75	
W.L.	B.C.R.	A.C.R.		RIG 22	FOREMAN BS
W.L.	Bailed to 40.0' from top of PVC. Apparently dry to 40.0'			DRAWN KO	APPROVED TKD
				JOB # 6148 A	SHEET

The stratification lines represent the approximate bound between soil types and the transition may be gradual.

LOG OF BORING NO. 7							
OWNER Town of Buchanan			ARCHITECT Carroll & Surveying				
SITE			PROJECT NAME Lehrer Landfill Site				
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	DESCRIPTION OF MATERIAL	UNCONFINED COMPRESSIVE STRENGTH (TONS/FT.²)	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %
			SURFACE ELEVATION = 729.7				
1	SS		Silty clay, trace to some sand - red brown-hard-(CL)				
2	2A ST		Silty fine sand, trace to some clay lumps, trace gravel - brown (SM-SC)				
3	ST		Silty, sandy clay, trace gravel - red brown-hard-(CL-SC)				
4	ST		Silty clay, trace sand, gravel with light gray brown silt seams - red brown-hard-(CL)				
5	ST						
6	ST						
7	ST		Silty clay, trace sand, gravel with trace decayed roots beginning at 25' to about 38.5' - 3/4" peat layer at 36.8' - brown to dark brown-tough to hard-(CL-CH)				
8	ST						
9	ST						
10	ST						
11	ST						
12	ST						
13	ST						
14	ST		Varved red silty clay(CH) and gray brown silty clay-(CL-CH) in 1/8" to 1/2" layers-very tough to hard-(CH & CL-CH)				
15	ST						
16	ST						
17	ST						
18	ST						
19	SS		Clayey, sandy gravel-brown-saturated-very dense-boulders from 79' to 81'-(GP-GC)				
81.0			End of Boring				
Note: 1. Well point installed after boring with tip at 57.0' 2. 2' of 4" Casing Used 3. Well point protector pipe installed 4. Elevation of top of PVC pipe - 731.9				*Calibrated Penetrometer			

UNCONFINED COMPRESSIVE STRENGTH (TONS/FT.²)

1 2 3 4 5

PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %

STANDARD "N" PENETRATION (BLOWS/FT.)

10 20 30 40 50

1 1/4" BIRMING

WATER LEVEL OBSERVATIONS			SOIL TESTING SERVICES		BORING STARTED 7-10-74	
W.L.	W.S. OR W.O.		OF WIS, INC.		BORING COMPLETED 7-10-74	
W.L.	D.C.P.	A.C.P.	GREEN BAY, WISCONSIN		RIG 26 FORTMAN 17	
W.L.	Before well point installed		500 LAMBEAU STREET		DRAWN JK APPROVED JD	
W.L.	After well point installed				JOB # 6148 SHEET	

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

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LOG OF BORING NO. 3

OWNER				ARCHITECT-ENGINEER						
SITE				PROJECT NAME						
Highway 55 and CTH EE Kaukauna, Wisconsin				Harris and Associates Proposed Lehrer Landfill						
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST. RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. 2				
						1 PLASTIC LIMIT %	2 WATER CONTENT %	3 LIQUID LIMIT %	4	5
X				SURFACE ELEVATION 723.1		STANDARD "N" PENETRATION (BLOWS/FT.)				
	1	ST				10	20	30	40	50
	2	ST		Reddish brown to brown silty clay with trace to some roots, trace gravel-very tough to hard-(CL)						
	3	ST								
	4	ST		Reddish brown silty clay with trace gravel-tough to hard-(CL)						
10	5	ST								
	6	ST								
15	7	ST		Reddish brown silty clay with trace to some organics-tough to very tough-(CL)						
20	8	ST		Permeability test on Sample 9						
25	9	ST								
30	10	ST								
35	11	ST								
40	12	ST								
45	13	ST								
50	14	ST		Varved reddish brown to gray brown clay and silt-tough to very tough-(CL & ML)						
55	15	ST		Permeability test on Sample 17						
60	16	ST								
65	17	ST								
70	18	ST								
75	19	ST		Gray to gray brown silty clay with trace gravel-tough-(CL)						
80	20	ST								
85	21	ST								
88										
				Continued						

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WATER LEVEL OBSERVATIONS		SOIL TESTING SERVICES OF WIS., INC. 540 LAMBEAU STREET GREEN BAY, WIS. 54303	BORING STARTED	12-10-75
W.L.	26.0' WD		BORING COMPLETED	12-10-75
W.L.	B.C.R.		RIG	22
W.L.	A.C.R.		DRAWN	KD
Bailed to 96.0' from top of PVC		JOB #	6148 A	APPROVED
				FOREMAN
				BS
				1KD
				SHEET
				1 of 2

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOG OF BORING NO. 3

OWNER

ARCHITECT-ENGINEER

Harris and Associates

SITE Highway 55 and CTH EE
Kaukauna, Wisconsin

PROJECT NAME

Proposed Lehrer Landfill

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. 2				
							1 PLASTIC LIMIT %	2 WATER CONTENT %	3 LIQUID LIMIT %		
					SURFACE ELEVATION ∇		STANDARD "N" PENETRATION (BLOWS/FT.)				
							10	20	30	40	50
88					Continued						
90	22	ST		II	Varved gray to gray brown clay and silt with trace to some gravel-tough to very tough-(CL & ML)						
95	23	ST		II							
100	24	ST		III	Gray gravel and clay-(GC)						
105	Rur	DB			Weathered Dolomite						
107	#1	NX			Dolomite bedrock Recovery = 100% - RQD = 100%						
					End of Boring						
					Water loss 100% at depth 106.5' to 107.0' Obstructions from depth 100.0' to 104.0' Observation well installed @ 101.0'						

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WATER LEVEL OBSERVATIONS

W.L.

W.L.

W I

B.C.B.

A.C.R.

~~Cave in @ 101.0' AB~~

SOIL TESTING SERVICES OF WIS., INC.

540 LAMBEAU STREET
GREEN BAY, WIS. 54303

BORING STARTED 12-10-75

BORING COMPLETED 12-10-75

RIG 22

FOREMAN BS

DRAWN KO

APPROVED TKD

JOB # 6148 A

SHEET 2 of 2

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOG OF BORING NO. 3-A

OWNER				ARCHITECT-ENGINEER			
SITE Highway 55 and CTH EE Kaukauna, Wisconsin				Harris and Associates PROJECT NAME Proposed Lehrer Landfill			

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. ²				
							1	2	3	4	5
							PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %		
							STANDARD "N" PENETRATION (BLOWS/FT.)				
X					SURFACE ELEVATION ↴ 723.0						
5					No soil sampling-installed well point at 70.0 feet						
10											
15											
20											
25											
30											
35											
40											
45											
50											
55											
60											
65											
70											
					End of Boring						

WATER LEVEL OBSERVATIONS				SOIL TESTING SERVICES OF WIS., INC. 540 LAMBEAU STREET GREEN BAY, WIS. 54303		BORING STARTED		12-15-75	
W.L. 23' WD						BORING COMPLETED		12-15-75	
W.L. B.C.R. A.C.R.						RIG 22		FOREMAN BS	
W.L. Bailed to 69.0' from top of PVC						DRAWN KO		APPROVED TKD	
						JOB # 6148 A		SHEET	

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOG OF BORING NO. 3-

OWNER	ARCHITECT-ENGINEER
	Harris and Associates
SITE Highway 55 and CTH EE Kaukauna, Wisconsin	PROJECT NAME Proposed Lehrer Landfill

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²				
							1	2	3	4	5
							PLASTIC LIMIT %		WATER CONTENT %		LIQUID LIMIT %
							X				
							STANDARD	"N"	PENETRATION	(BLOWS/FT.)	
							10	20	30	40	50
5		PA									
10											
15											
20											
25		PA			No soil sampling-installed well point at 45 feet						
30											
35											
40											
45											
					End of Boring						

WATER LEVEL OBSERVATIONS			SOIL TESTING SERVICES OF WIS., INC. 540 LAMBEAU STREET GREEN BAY, WIS. 54303	BORING STARTED	
W.L.	23' WD			BORING COMPLETED	
W.L.	B.C.R.	A.C.R.		RIG	FOREMAN
W.L.	Bailed to 46.0'			DRAWN	APPROVED
				JOB # 6148 A	SHEET
			The stratification lines represent the approximate boundary between soil types and the transition may be gradual.		

00779

20023

LOG OF BORING NO. 4									
OWNER					ARCHITECT-ENGINEER				
SITE Highway 55 and CTH EE Kaukauna, Wisconsin					PROJECT NAME Proposed Lehrer Landfill				
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST. RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. 2			
						<div style="display: flex; justify-content: space-around; font-size: 0.8em;"> 12345 </div> <div style="display: flex; justify-content: space-around; font-size: 0.8em;"> PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT % </div> <div style="display: flex; justify-content: space-around; font-size: 0.8em;"> X — — — △ </div> <div style="display: flex; justify-content: space-around; font-size: 0.8em;"> STANDARD "N" PENETRATION (BLOWS/FT.) </div>			
				SURFACE ELEVATION 667.1		<div style="display: flex; justify-content: space-around; font-size: 0.8em;"> 1020304050 </div>			
	1	ST		Red brown sandy clayey topsoil-with trace gravel and roots-very tough-(SC)					
	2	ST		Red brown silty clay-trace to some sand and gravel-stiff to very tough-(CL)					
	3	ST							
	4	ST							
10	5	ST		Red brown silty clay with trace to some gravel-tough to very tough-(CL)					
	6	ST							
	7	ST							
20									
	8	ST		Red brown silty clay with trace to some gravel, cobbles, and boulders-tough to very tough-(GC)					
30	9	ST							
	10	ST							
40									
	11	ST							
	12	ST							
50									
52.0	13	ST			132				
				End of Boring		*Calibrated Penetrometer			
				Boulders or obstructions from 18' to 22' Boulders likely from 18' to end of boring Observation well installed					

00774

WATER LEVEL OBSERVATIONS			SOIL TESTING SERVICES OF WIS., INC. 540 LAMBEAU STREET GREEN BAY, WIS. 54303		BORING STARTED 12-31-75	
W.L.					BORING COMPLETED 1-2-76	
W.L.	B.C.R.	A.C.R.			RIG 22	FOREMAN BS
W.L.	0.5' AB				DRAWN KO	APPROVED TKD
Bailed to 50.0' from top of PVC			JOB # 6148 A		SHEET	

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOG OF BORING NO. 4-A											
OWNER					ARCHITECT-ENGINEER						
Harris and Associates											
SITE Highway 55 and CTH EE Kaukauna, Wisconsin					PROJECT NAME Proposed Lehrer Landfill						
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST. RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. 2					
						1	2	3	4	5	
						PLASTIC LIMIT %	WATER CONTENT %		LIQUID LIMIT %		
						X-----	-----●-----		-----△-----		
						STANDARD "N" PENETRATION (BLOWS/FT.)					
						10	20	30	40	50	
5				No samples - well point installed at 30.0 feet							
10											
15											
20											
25											
30											
				End of Boring							
WATER LEVEL OBSERVATIONS					SOIL TESTING SERVICES OF WIS., INC. 540 LAMBEAU STREET GREEN BAY, WIS. 54303		BORING STARTED				
W.L. B.C.R. A.C.R.							BORING COMPLETED				
W.L. 0.5' AB							RIG FOREMAN				
Bailed to 31.0'							DRAWN APPROVED				
							JOB # 6148 A SHEET				
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.											

LOG OF BORING NO. 5

OWNER				ARCHITECT-ENGINEER						
SITE				PROJECT NAME						
Highway 55 and CTH EE Kaukauna, Wisconsin				Proposed Lehrer Landfill						
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST. RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. 2				
						1	2	3	4	5
						PLASTIC LIMIT %	WATER CONTENT %		LIQUID LIMIT %	
						X	X		X	
						STANDARD "N" PENETRATION (BLOWS/FT.)				
						10	20	30	40	50
728.9										
1	ST			Brown sandy topsoil-hard-(SC)						
2	ST			Brown silty clay with trace to some sand and gravel-very tough to hard-(CL)						
3	ST									
4	ST			Red brown silty clay with trace gravel-tough-(CL)	112					
5	ST			Brown clayey silt with trace sand and gravel-hard-(ML)	113					
6	ST									
7	ST			Brown silty clay with trace gravel-soft to tough-(CL-CH)	118					
8	ST			Permeability Test on Sample 8						
9	ST			Red brown silty clay with trace gravel and woody fibers-very tough to hard-(CL)	106					
10	ST									
11	ST									
12	ST			Red brown silty clay with occasional silt seams-hard-(CL)						
13	ST									
14	ST									
15	ST									
16	ST			Varved red brown clay and gray brown silt 1/4" to 1.0" in thickness-tough to very tough-(CL & ML) Permeability test on Sample 18						
17	ST									
18	ST									
19	ST									
20	ST									
21	ST			Gray brown silty clay with trace to some gravel and occasional seams of red clay-tough-(CL) Permeability test on Sample 22						
22	ST									
End of Boring Observation well installed at 90.0'						*Calibrated Penetrometer				

WATER LEVEL OBSERVATIONS	
W.L.	
W.L.	B.C.R. A.C.R.
W.L.	

SOIL TESTING SERVICES
OF WIS., INC.
540 LAMBEAU STREET
GREEN BAY, WIS. 54303

BORING STARTED	12-18-75
BORING COMPLETED	12-22-75
RIG 22	FOREMAN BS
DRAWN KO	APPROVED TKD
JOB # 6148 A	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOG OF BORING NO. 5-A

OWNER				ARCHITECT-ENGINEER Harris and Associates			
SITE Highway 55 and CTH EE Kaukauna, Wisconsin				PROJECT NAME Proposed Lehrer Landfill			

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. ²				
							1	2	3	4	5
							PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %		
							STANDARD "N" PENETRATION (BLOWS/FT.)				
X					SURFACE ELEVATION ↴ 729.1						
5					No soil sampling well point installed at 70.0 feet						
10											
15											
20											
25											
30											
35											
40											
45											
50											
55					End of Boring Obstruction at 66.0 feet						
60											
65											
70											

WATER LEVEL OBSERVATIONS				SOIL TESTING SERVICES OF WIS., INC. 540 LAMBEAU STREET GREEN BAY, WIS. 54303		BORING STARTED		12-16-75	
W.L. 19.0' WD						BORING COMPLETED		12-18-75	
W.L. B.C.R. A.C.R.						RIG 22		FOREMAN BS	
W.L. 63.1' after bailing						DRAWN KO		APPROVED TKD	
						JOB # 6148 A		SHEET	

The stratification lines represent the approximate boundary
 between soil types and the transition may be gradual.

00771

LOG OF BORING NO. 51

OWNER	ARCHITECT-ENGINEER Harris and Associates
SITE Highway 55 and CTH EE Kaukauna, Wisconsin	PROJECT NAME Proposed Lehrer Landfill

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST. RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. ³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. ²				
						1	2	3	4	5
						PLASTIC LIMIT %		WATER CONTENT %		LIQUID LIMIT %
						X				△
						STANDARD "N"		PENETRATION (BLOWS/FT.)		
						10	20	30	40	50
5										
10										
15										
20										
25										
30										
35										
40										
45										
50										
				End of Boring						

WATER LEVEL OBSERVATIONS			SOIL TESTING SERVICES OF WIS., INC. 540 LAMBEAU STREET GREEN BAY, WIS. 54303	BORING STARTED	
W.L.	49.8' AB			BORING COMPLETED	
W.L.	B.C.R.	A.C.R.		RIG 22	FOREMAN
W.L.	Bailed to 49.8' from top			DRAWN KO	APPROVED TKD
	of PVC			JOB # 6148 A	SHEET
			The stratification lines represent the approximate boundary between soil types and the transition may be gradual.		

00770

LOG OF BORING NO. 6

OWNER				ARCHITECT-ENGINEER						
SITE				PROJECT NAME						
Highway 55 and CTH EE Kaukauna, Wisconsin				Proposed Lehrer Landfill						
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST. RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. 2				
						1	2	3	4	5
						PLASTIC LIMIT %	WATER CONTENT %		LIQUID LIMIT %	
						X	STANDARD "N" PENETRATION (BLOWS/FT.)		Δ	
						10	20	30	40	50
5	1	ST		SURFACE ELEVATION 678.84						
10	2	ST		Red brown to brown silty clay with trace to some sand and gravel and with trace to some roots,woody fibers and black peaty pockets-possibly fill material-soft to very tough-(CL) Permeability test on Sample 2						
15	3	ST								
20	4	ST								
25	5	ST								
30	6	ST								
35	7	ST		Irregularly varved red brown clay and gray brown silt with trace gravel-tough-(CL-ML) Permeability test on Sample 9						
40	8	ST								
45	9	ST								
50	10	ST		Brown silty clay with trace to some gravel in the form of limestone pieces-trace to some cobbles and boulders-tough-(CL)						
55	11	ST								
60	12	ST								
65	13	SS								
70	14	SS		Brown silty clay with trace to some sand,gravel, cobbles and boulders-hard-(GC)						
75	15	SS								
80	16	SS		Weathered broken rock						
85	RB									
End of Boring 61' of NX casing					*Calibrated Penetrometer					
Boulders or obstructions from 43' to end of boring Observation well installed at 64.5'										
WATER LEVEL OBSERVATIONS					BORING STARTED		12-23-75			
W.L. 10.0' WS					BORING COMPLETED		12-23-75			
W.L. 5.0' B.C.R. 5.0' A.C.R.					RIG 22		FOREMAN BS			
W.L. 27.0' AB					DRAWN KO		APPROVED TKD			
Bailed to 27.0' from top of PVC					JOB = 6148 A		SHEET			
SOIL TESTING SERVICES OF WIS., INC. 540 LAMBEAU STREET GREEN BAY, WIS. 54303					The stratification lines represent the approximate boundary between soil types and the transition may be gradual.					

LOG OF BORING NO. 6-^										
OWNER					ARCHITECT-ENGINEER					
SITE Highway 55 and CTH EE Kaukauna, Wisconsin					PROJECT NAME Proposed Lehrer Landfill					
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST. RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²				
						1	2	3	4	5
						<div style="display: flex; justify-content: space-around;"> ○ </div> <div style="display: flex; justify-content: space-around;"> PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT % </div> <div style="display: flex; justify-content: space-around;"> X----- ●----- -----△ </div> <div style="display: flex; justify-content: space-around;"> STANDARD "N" PENETRATION (BLOWS/FT.) </div> <div style="display: flex; justify-content: space-around;"> ⊗ </div>				
SURFACE ELEVATION ↴						10	20	30	40	50
5				No samples taken-well point installed at 51.0 feet						
10		RB								
15										
20										
25										
30										
35		RB								
40										
45										
50										
51.0				End of Boring						
						00768				

WATER LEVEL OBSERVATIONS				SOIL TESTING SERVICES OF WIS., INC. 540 LAMBEAU STREET GREEN BAY, WIS. 54303	BORING STARTED 12-31-75	
W.L.	0.5' AB				BORING COMPLETED 12-31-75	
W.L.	B.C.R.	A.C.R.			RIG 22	FOREMAN BS
W.L.					DRAWN KO	APPROVED TKD
					JOB # 6148 A	SHEET
				The stratification lines represent the approximate boundary between soil types and the transition may be gradual.		

LOG OF BORING NO. 6-11

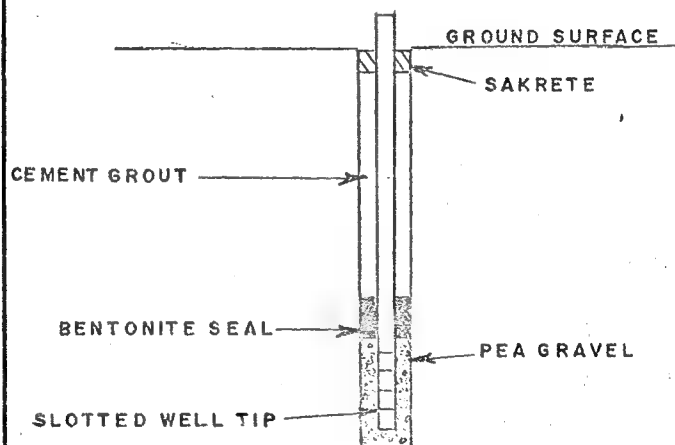
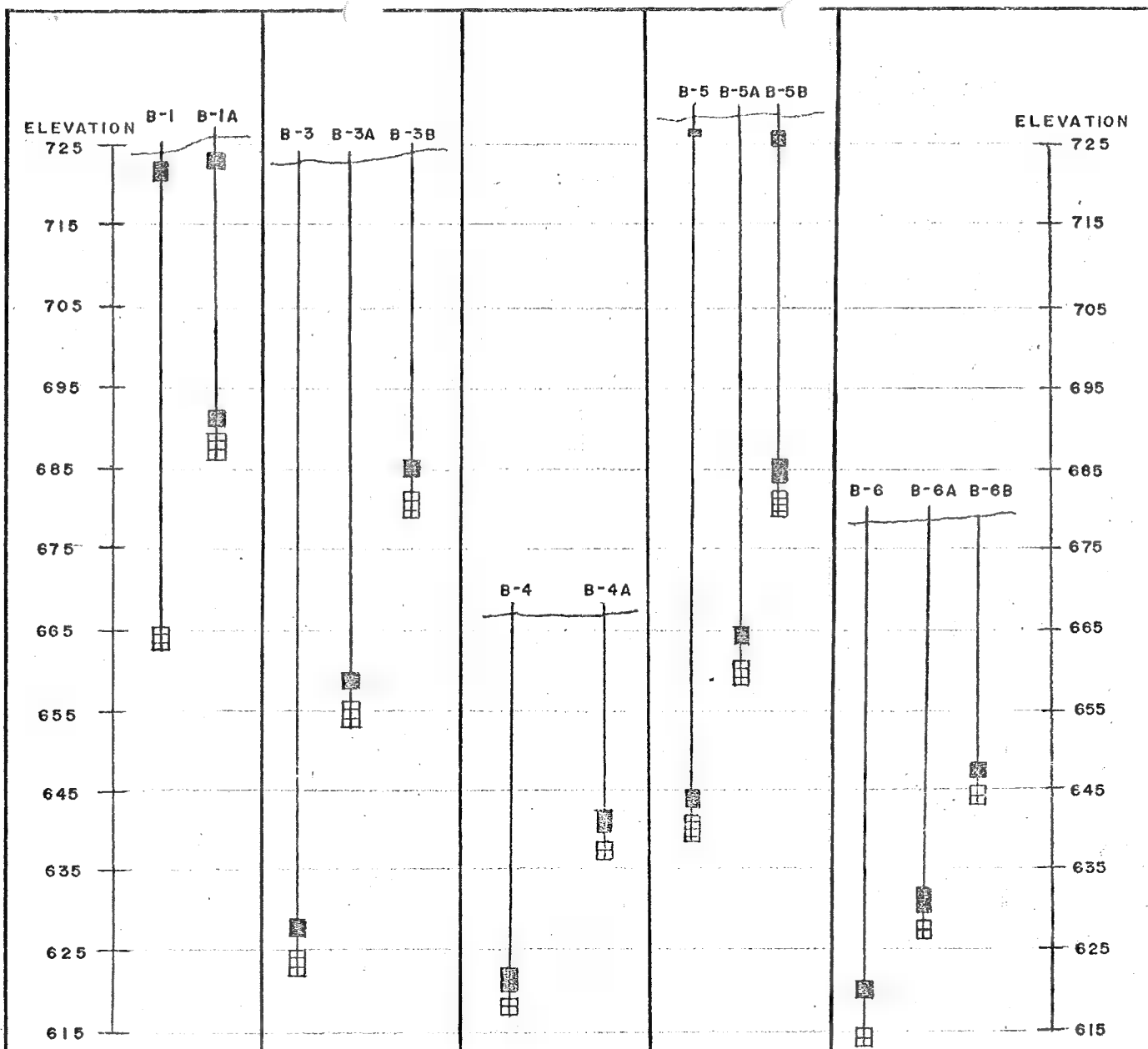
OWNER	ARCHITECT-ENGINEER Harris and Associates
SITE Highway 55 and CTH EE Kaukauna, Wisconsin	PROJECT NAME Proposed Lehrer Landfill

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST. RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. ²				
						1	2	3	4	5
						PLASTIC LIMIT %		WATER CONTENT %		LIQUID LIMIT %
						X		●		△
						STANDARD "N"		PENETRATION (BLOWS/FT.)		
						10	20	30	40	50
5				No samples taken-well point installed at 36.0 feet						
10										
15		RB								
20										
25										
30										
35										
36.0										
				End of Boring						
				PVC broken off at ground						

WATER LEVEL OBSERVATIONS				SOIL TESTING SERVICES OF WIS., INC. 540 LAMBEAU STREET GREEN BAY, WIS. 54303	BORING STARTED 12-30-75	
W.L.	0.5' AB				BORING COMPLETED 12-30-75	
W.L.	B.C.R.		A.C.R.		RIG 22	FOREMAN BS
W.L.	34.4' after bailing				DRAWN KO	APPROVED TKD
	Bailed to 34.4' from top of PVC				JOB # 6148 A	SHEET

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

00767



NOTES:

1. 1 1/2" Ø PVC PIPE USED FOR RISERS
2. TIPS WRAPPED WITH FILTER X MATERIAL
3. PEA GRAVEL FILLED AROUND TIPS
4. BENTONITE SEAL MADE WITH PELLETS
5. BORE HOLE GROUTED TO SURFACE

**SCHEMATIC DIAGRAM
OBSERVATION WELL INSTALLATION**

**SOIL TESTING SERVICES
OF WISCONSIN, INC.**

540 LAMBEAU ST.

GREEN BAY, WISCONSIN 54303

K.O. T.K.D. 2-10-76 6148 A

00766

00026

LEHRER LANDFILL

Job No. 6148-A

SUMMARY OF CONSTANT HEAD PERMEABILITY TEST RESULTS

Boring	Sample	Depth	Soil Description	Test Duration (Seconds)	Coefficient of Permeability (cm/sec)
3	9	25'-27'	Red brown silty clay with trace to some organic matter (CL)	60,300	5.0×10^{-9}
				25,200	1.3×10^{-8}
				242,100	4.9×10^{-9}
3	17	65'-67'	Varved reddish brown to gray brown clay and silt (CL & ML)	25,200	3.0×10^{-8}
				60,900	1.7×10^{-8}
				181,200	1.0×10^{-8}
5	8	20'-22'	Red brown silty clay, trace gravel (CL-CH)	64,800	2.6×10^{-8}
				30,600	4.8×10^{-8}
				71,700	2.4×10^{-8}
5	18	70'-72'	Varved red & brown clay & gray brown silt in $\frac{1}{4}$ " to 1" seams (CL & ML)	25,200	8.1×10^{-9}
				60,900	5.0×10^{-9}
				27,000	9.0×10^{-9}
5	22	90'-92'	Gray brown silty clay, trace to some gravel, red clay seams (CL)	23,400	1.6×10^{-8}
				24,000	3.1×10^{-8}
				71,700	1.5×10^{-8}
6	2	2'-4'	Red brown to brown silty clay, trace to some sand, gravel-(CL)	87,300	2.8×10^{-8}
				60,300	2.5×10^{-8}
				25,200	3.3×10^{-8}

00765

CONT'D

LEHRER LANDFILL

Job No. 6148-A

SUMMARY OF CONSTANT HEAD PERMEABILITY TEST RESULTS

Boring	Sample	Depth	Soil Description	Test Duration (Seconds)	Coefficient of Permeability (cm/sec)
6	9	25'-27'	Irregularly varved red brown clay & gray brown silt, trace gravel (CL-ML)	87,300	2.9×10^{-8}
				60,300	3.3×10^{-8}
				26,400	4.2×10^{-8}

00764

~~00924~~

LEHRER LANDFILL

6148-A

SUMMARY OF WATER LEVEL OBSERVATIONS

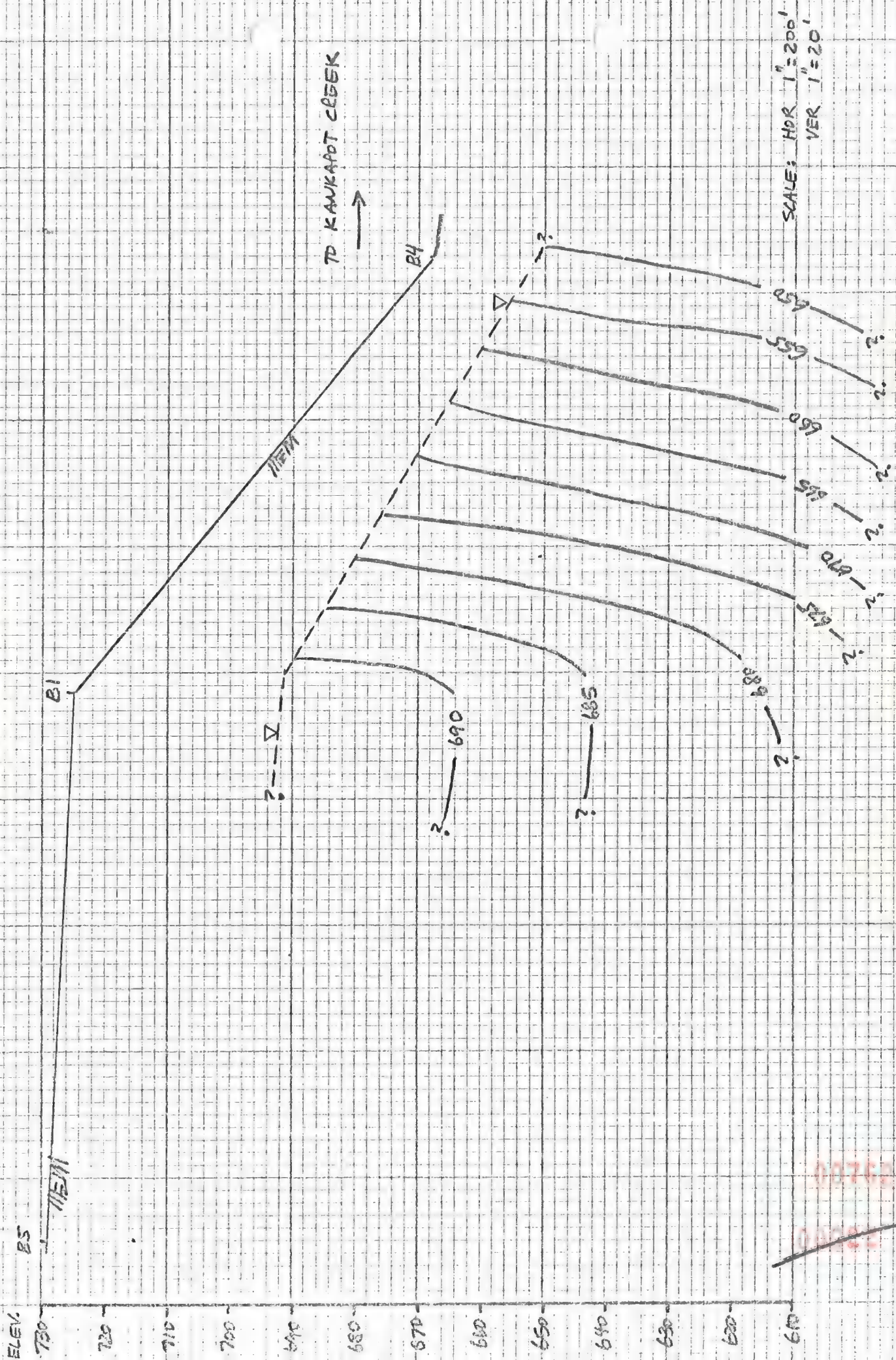
Location	Elevation Top of PVC	Elevation Ground Surface	Elevation Bentonite Seal	Water Level After Bailing	Water Level			
					2-5-76	2-10-76	2-17-76	2-26-76
B1	725.4	724.7	665	*	*	690.7	690.4	690.4
B1A	726.9	725.4	688.5	Dry	689.9	692.2	693.9	694.9
B2*	731.9	729.7	726	*	*	*	*	*
B3	724.44	723.1	627	626.4	651.9	653.9	653.6	654.1
B3A	724.2	723.0	658	655.2	693.2	694.7	696.2	696.2
B3B	722.9	724.39	683	676.9	697.9	697.9	697.9	697.9
B4	668.5	667.1	620	618.5	638.1	641.8	644.5	648.3
B4A	668.6	667.1	639.5	638.6	645.3	647.1	648.8	650.6
B5	730.2	728.9	642.5	***	682.2	683.2	683.2	683.2
B5A	730.4	729.1	664	667.3	682.4	683.9	684.4	684.4
B5B	730.5	729.0	683.5	680.7	724.5	724.5**	716.5	718.0
B6	680.24	678.84	619	653.2	653.2	653.9	654.2	654.2
B6A	*	*	629.5	*	*	*	*	9.5'
B6B	679.24	679.24	644.5	644.8	656.9	658.2	659.7	661.2

Notes

1. All elevations referenced to Kaukauna City Datum
 2. B1 and B2 completed in July, 1974. Remaining borings completed during December, 1975 and January, 1976.
- * Unable to locate
 ** Rebailed to 693.5 on 2-10-75
 *** WL @ 693.5, 1 Hr. after bailing
 **** Could not bail below 682

STS-648A

PRELIMINARY* GENERALIZED GROUNDWATER
EQUIPOTENTIAL CROSS SECTION
SECTION A-A

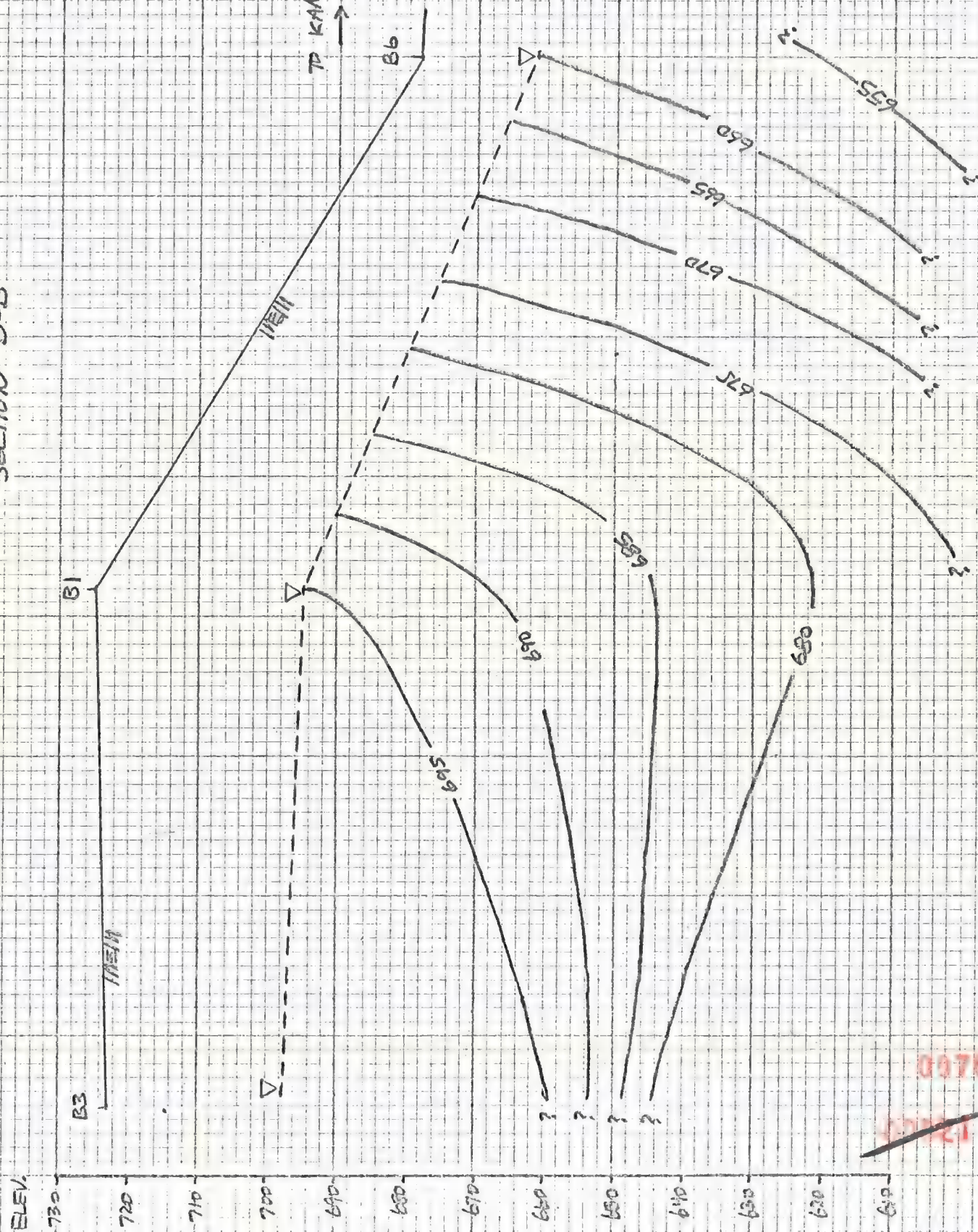


SCALE: HOR 1"=200'
VER 1"=20'

* BASED ON 2-26-76 WATER LEVEL
DATA. ADDITIONAL WELLS TO BE
INSTALLED

513-6148-A

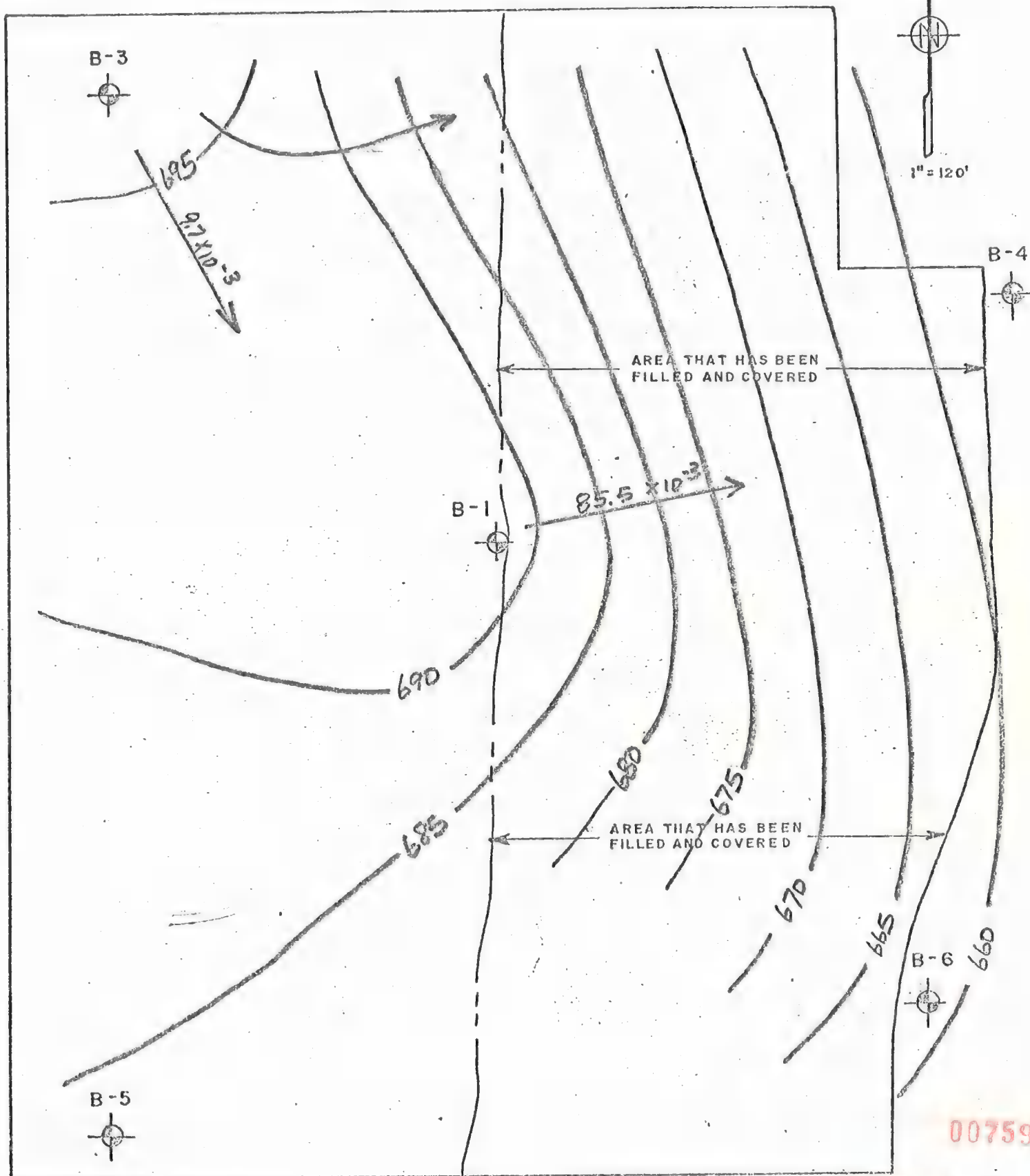
PRELIMINARY* GENERALIZED GROUNDWATER
EQUIPOTENTIAL CROSS SECTION
SECTION B-B



* BASED ON 2-26-76 WATER
LEVEL DATA. ADDITIONAL WELLS
TO BE INSTALLED

00781

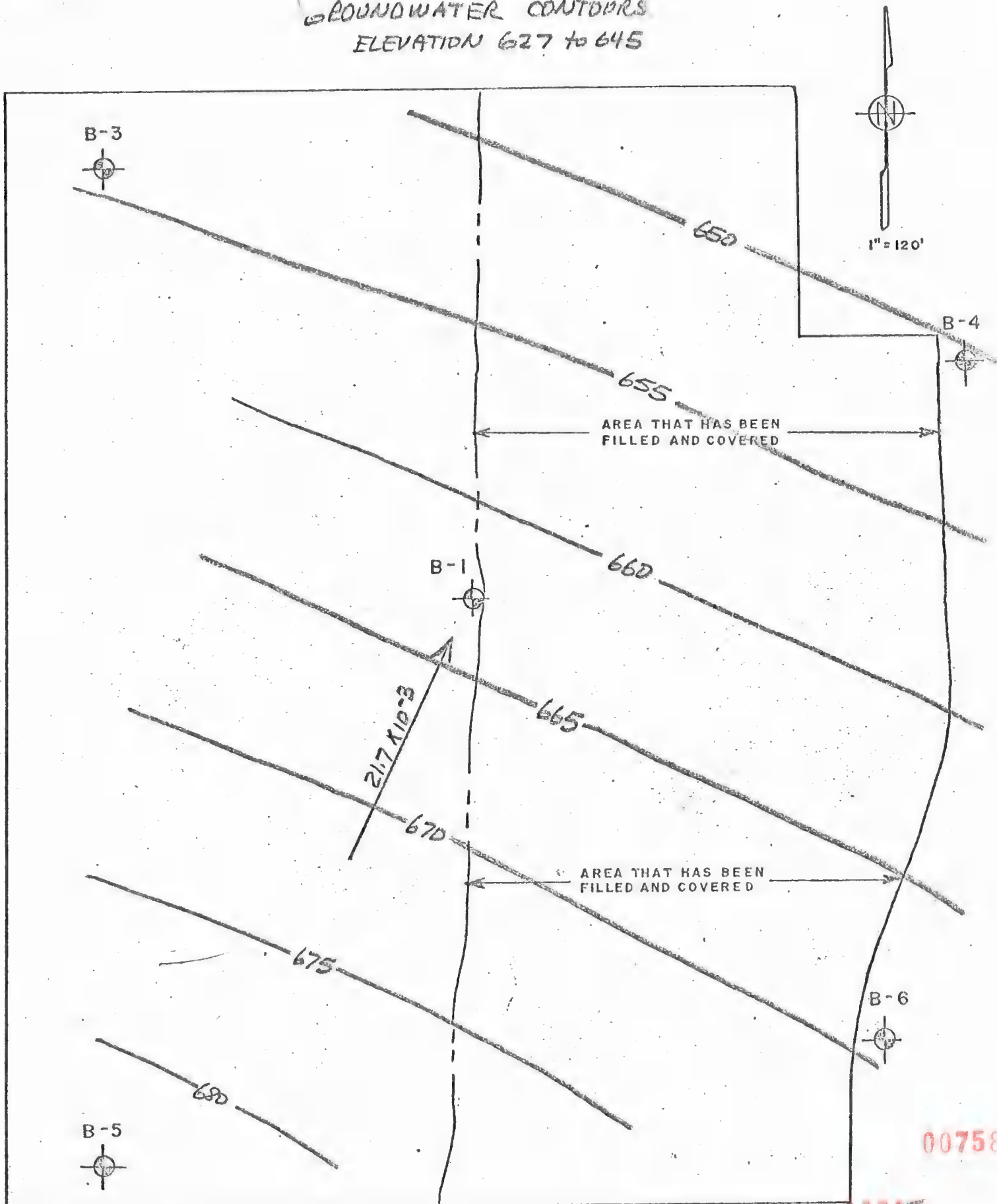
GROUNDWATER CONTOURS
ELEVATION 645 to 665



*BASED ON 2-26-76 WATER
LEVEL DATA

1" = 120'

GROUNDWATER CONTOURS
ELEVATION 627 to 645



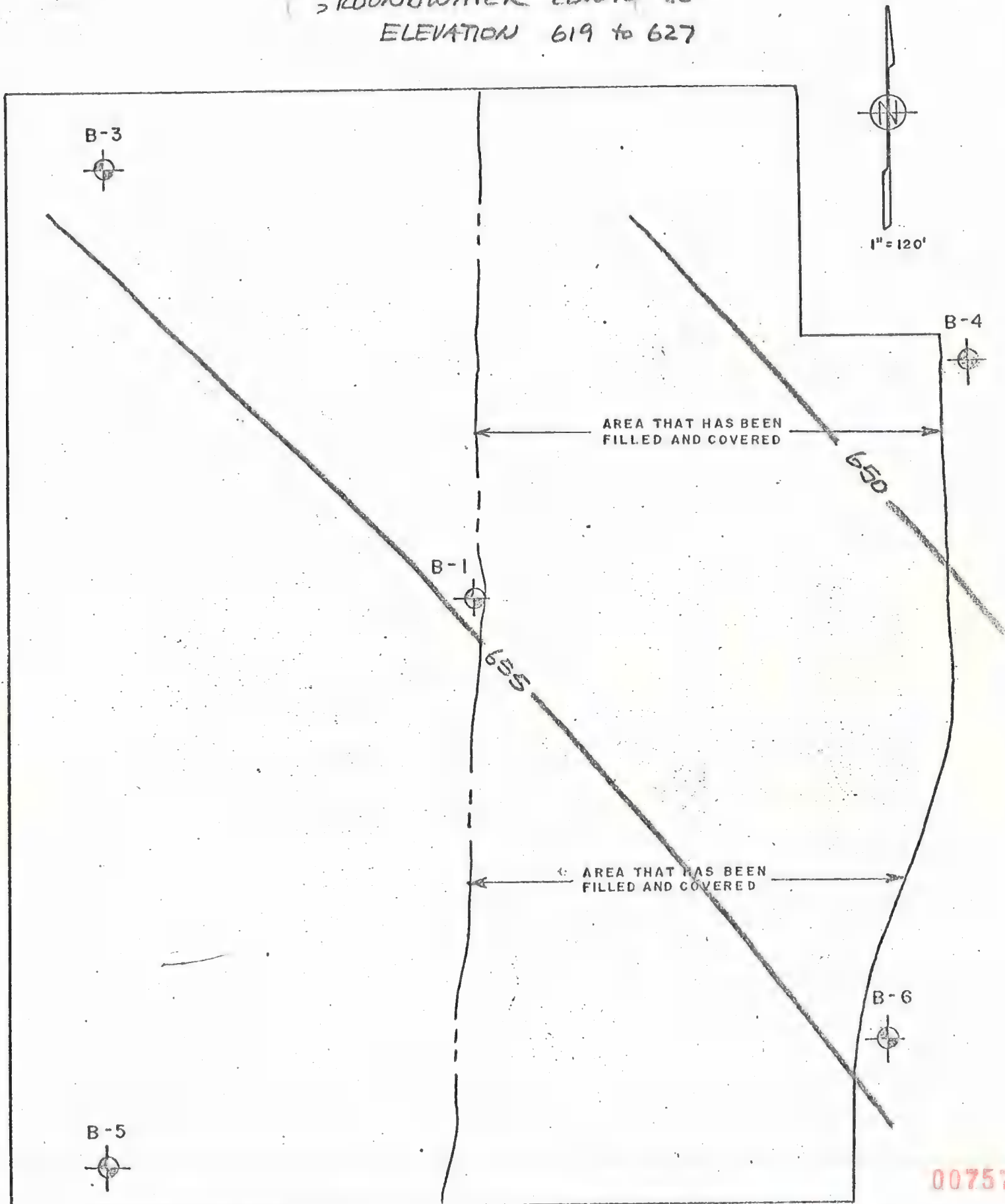
00758

00815

*BASED ON 2-26-76 WATER
LEVEL DATA

1" = 120'

GROUNDWATER CONTO 25'
ELEVATION 619 to 627

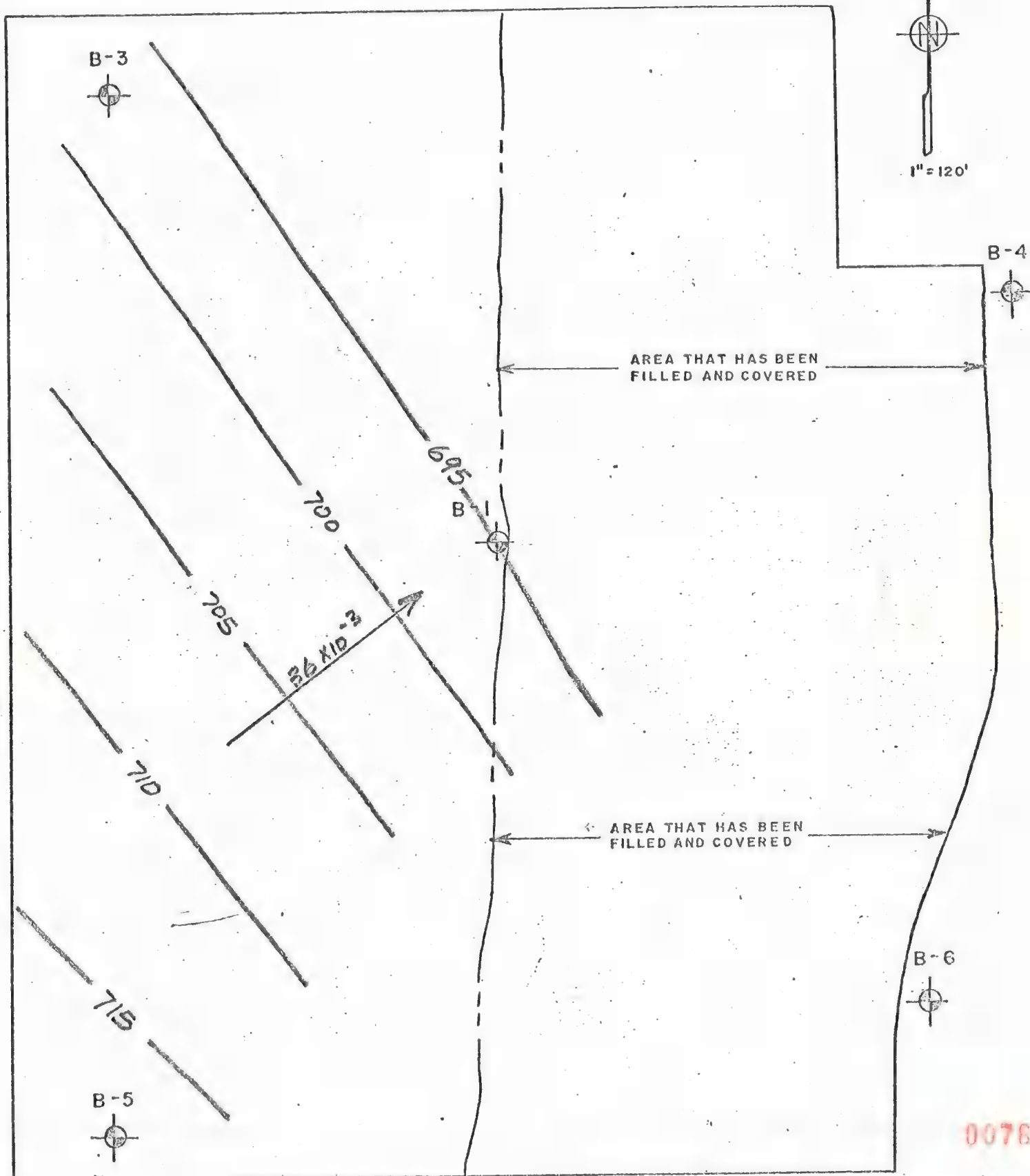


*BASED ON 2-26-76 WATER
LEVEL DATA

1" = 120'

00757

GROUNDWATER CONTOUR *
ELEVATION 665 TO 690



*BASED ON 2-26-76 WATER
LEVEL DATA

~~00020~~
1" = 120'

00760

PRELIMINARY
SUMMARY OF VERTICAL GROUND WATER GRADIENTS*

<u>Location</u>	<u>Direction of Flow</u>	<u>Gradient</u>
B1A to B1	Down	191×10^{-3}
B3B to B3A	Down	68×10^{-3}
B3A to B3	Down	1358×10^{-3}
B4A to B4	Down	118×10^{-3}
B5A to B5	Down	55.8×10^{-3}
B6B to B6	Down	275×10^{-3}

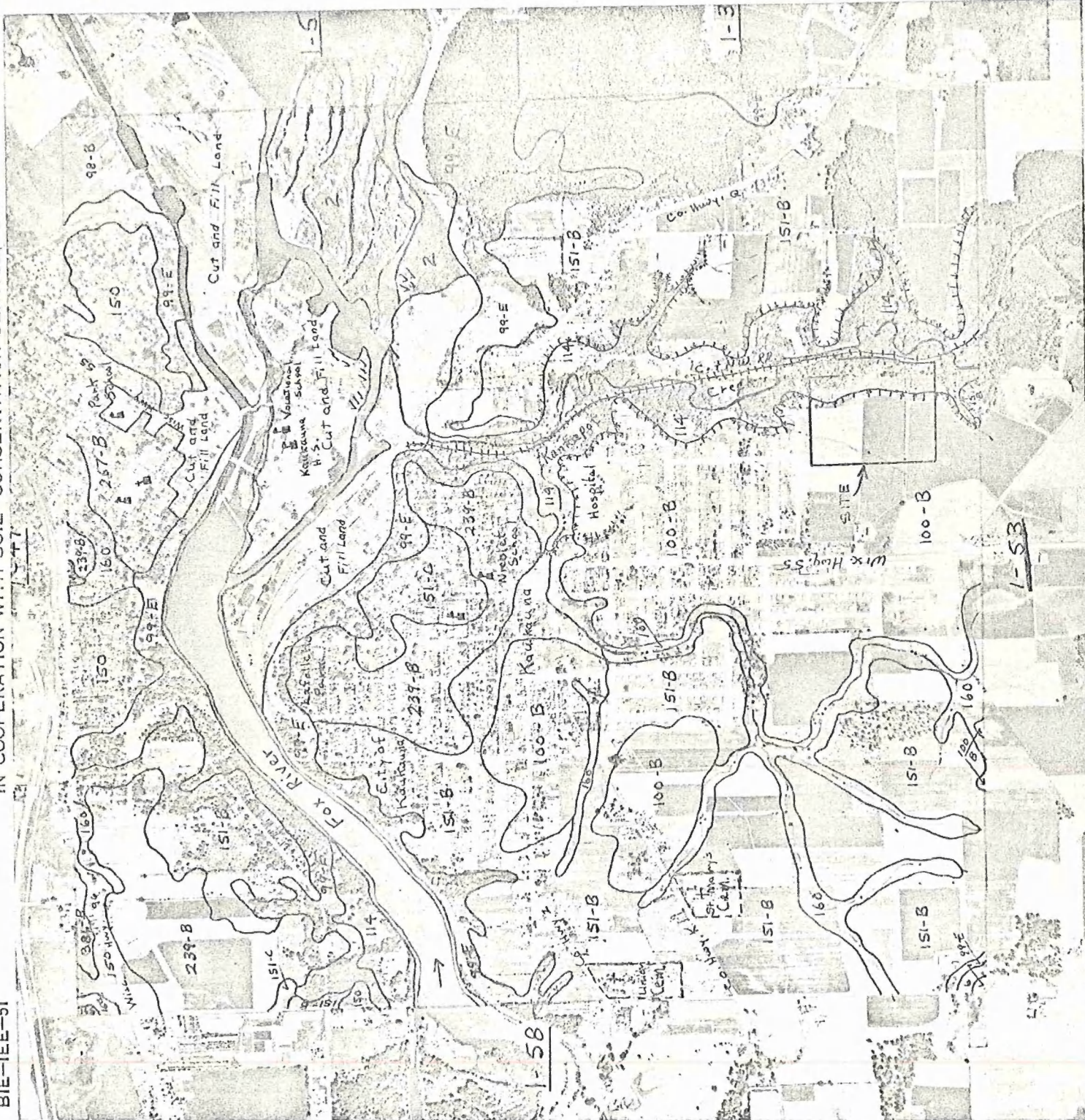
*Based on 2-26-76 Water Level Data

~~00016~~

00756

OUTAGAMIE COUNTY, WISCONSIN, SOIL AND WATER CONSERVATION DISTRICT
IN COOPERATION WITH SOIL CONSERVATION SERVICE, USDA

BIE-IEE-51



ADVANCE FIELD SHEET
SUBJECT TO CHANGE

APPROXIMATELY ONE MILE

USDA SCS LINCOLN, NEB. JAN. 1974-SR

00013

00755

SOIL SURVEY INTERPRETATIONS ^{1/}

SOIL NO. 100 & 99 ^{2/}
SERIES Kewaunee
STATE Wisconsin
MLRA 95

Well drained, gently sloping to steep soils with clayey subsoils and clayey substratums formed in glacial drift. These soils have moderate available water capacity and low permeability.

ESTIMATED SOIL PROPERTIES SIGNIFICANT TO ENGINEERING

Major Soil Horizons (inches)	Classification			Coarse Fract. >3 in. %	Percentage less than 3 inches Passing Sieve No.--				LL	PI	Permeability in./hr.	Avail. Water Capac. in./in.	Soil Reaction pH	Shrink Swell Potential
	USDA Texture	Unified	AASHO		4	10	40	200						
0-10	sil	ML, CL-ML	A-4	-	100	100	95-100	85-95	25-35	2-6	0.6-2.0	.22-.24	5.6-7.3	Low
10-24	c	CH	A-7	-	100	100	90-100	80-90	55-65	30-35	.06-0.2	.09-.11	5.6-6.5	High
24-60	c	CH	A-7	-	100	100	90-100	80-90	55-65	30-35	.06-0.2	.09-.11	7.4-8.4	Moderate
Flooding None Hydrologic group: C Depth to water table: More than 5 feet Depth to bedrock: More than 5 feet Corrosivity - uncoated steel: Low Corrosivity - concrete: Low														

SUITABILITY OF SOIL AS SOURCE OF SELECTED MATERIAL AND FEATURES AFFECTING USE

Roadfill	Poor - low shear strength; high compressibility.
Sand	Unsuitable - excess of fines.
Gravel	Unsuitable - excess of fines.
Topsoil	Fair for 2 to 12% slopes; poor for steeper soils.

DEGREE AND KIND OF SOIL LIMITATION FOR SELECTED USES

Septic Tank Filter Fields	Severe - slow permeability.
Sewage Lagoons	Moderate for 2 to 6% slopes; severe for steeper soils; slow permeability.
Shallow Excavations	Moderate - clayey subsoil and substratum; difficult to excavate.
Dwellings:	
With Basements)	Moderate - clayey subsoil and substratum; moderate to high shrink-swell.
Without Basements)	
Sanitary Landfill	Moderate - clayey subsoil and substratum; difficult to work; slow permeability.
Local Roads and Streets	Severe - clayey subsoil and substratum; moderate to high shrink-swell; moderate frost action.
Potential Frost Action	Moderate - strong capillary action.

MAJOR SOIL FEATURES AFFECTING SELECTED USES

Pond Reservoir Areas	Slowly permeable; clayey subsoil and substratum.
Embankments, Dikes, and Levees	Low shear strength; high compressibility.
Drainage of Cropland and Pasture	Natural drainage adequate.
Irrigation	Slow permeability; medium available water capacity.
Terraces and Diversions	Clayey subsoil and substratum; severe erosion hazard on steeper soils.
Grassed Waterways	Clayey subsoil and substratum; severe erosion hazard on steeper soils.
Golf Course Fairways	Slowly permeable; slow to dry; muddy when wet.

^{1/} Use in conjunction with Guide to Soil Survey Interpretation Sheets.

^{2/} 99 soils are the * units.

Series Kewaunee

DEGREE OF SOIL LIMITATION AND MAJOR FEATURES AFFECTING RECREATION USES

Camp Areas	Moderate for 2 to 12% slopes; severe for steeper soils; slowly permeable; muddy when wet.
Picnic Areas	Slight for 2 to 6% slopes; moderate for 6 to 12% slopes; severe for steeper soils.
Playgrounds	Moderate for 2 to 6% slopes; severe for steeper soils; leveling may expose clayey subsoil.
Paths and Trails	Slight for 2 to 12% slopes; moderate for 12 to 20% slopes; severe for steeper soils; muddy when wet.

CAPABILITY, SOIL LOSS FACTORS, AND POTENTIAL YIELDS--(High level management)

Phases of Series	Capability	Soil Loss		Corn grain (bu)	Corn silage (T)	Oats (bu)
		K	T			
2-6%	Ile6	.43	3	85	15	75
6-12%	IIIe6			80	13	70
6-12%*	IVe6			70	10	60
12-20%	IVe6			70	10	60
12-20%*	VIe6			-	-	-
20-30%	VIe6			-	-	-
20-45%*	VIIe6			-	-	-

PASTURELAND AND HAYLAND

Phases of Series	Group	Species, Yield in AUMs for Dryland (Irrigated) Forage Production
2-12%	As1	Alfalfa-brome hay - 4.5 T/A; bluegrass pasture - 140 AUD.
12-20%	As1	Alfalfa-brome hay - 4.0 T/A; bluegrass pasture - 130 AUD.
20-30%	Ar1	Alfalfa-brome hay - 3.5 T/A; bluegrass pasture - 130 AUD.
6-20%*	As1	Alfalfa-brome hay - 4.0 T/A; bluegrass pasture - 130 AUD.
20-45%*	Ar1	Alfalfa-brome hay - 2.5 T/A; bluegrass pasture - 100 AUD.

WILDLIFE HABITAT SUITABILITY

Phases of Series	Potential for--							Potential for--		
	Grain and Seed Crops	Grasses, Legumes	Wild Herbaceous Plants	Hardwood Trees and Shrubs	Coniferous Plants	Wetland Food and Cover	Shallow Water Devel.	Openland Wildlife	Woodland Wildlife	Wetland Wildlife
2-12%	Good	Good	Good	Good	Good	V. poor	V. poor	Good	Good	V. poor
12-20%	Fair	Good	Good	Good	Good	V. poor	V. poor	Fair	Good	V. poor
20-30%	V. poor	Fair	Good	Good	Good	V. poor	V. poor	Poor	Good	V. poor
6-12%*	Fair	Good	Poor	Fair	Fair	V. poor	V. poor	Fair	Fair	V. poor
12-45%*	V. poor	Fair	Poor	Fair	Fair	V. poor	V. poor	Poor	Fair	V. poor

WOODLAND SUITABILITY

Phases of Series	Ordination	Potential Productivity		Woodland Management Hazards				Suitable Species		Other
		Important Trees	Site Index	Erosion Hazard	Equipment Limitations	Seeding Mortality	Plant Competition	To Favor	To Plant	
2-12%	2c1	red oak	MH	Slight	Slight	Slight	Slight	red oak	wh. pine	
6-12%*	2c1	sugar		Slight	Slight	Slight	Slight	sugar	wh. spruce	
12-30%	2c2	maple		Moderate	Moderate	Sl. N&E)	Slight	maple	bl. spruce	
12-30%*	2c2	beech		Moderate	Moderate	Mod. S&W)	Slight			
20-45%*	2c2			Moderate	Moderate	do.	Slight			

RANGE

Phases of Series	Range Site Name	Climax Vegetation and Productivity of Air-Dry Herbage (lb./ac.)

WINDBREAK

Group	Adapted Trees to Plant	Tree Height Prediction at 20 Years Age	Relative Vigor

OTHER

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